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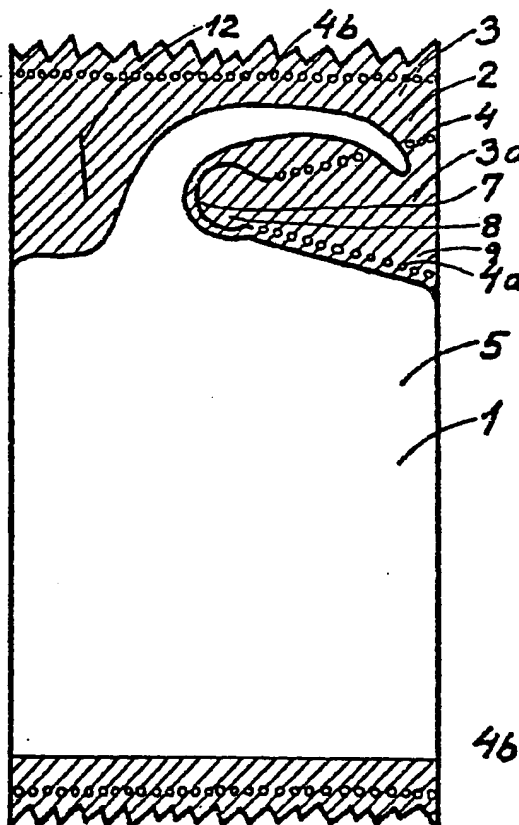
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>3</sup>: B65D 75/62; B29C 27/02</p>	<p>A1</p>	<p>(11) International Publication Number: WO 80/00332 (43) International Publication Date: 6 March 1980 (06.03.80)</p>
<p>(21) International Application Number: PCT/DK79/00022 (22) International Filing Date: 27 July 1979 (27.07.79) (31) Priority Application Number: 3356/78 (32) Priority Date: 28 July 1978 (28.07.78) (33) Priority Country: DK  (71) Applicant (for all designated states except US): OLE GRAM A/S [DK/DK]; Pilegårdsparken, 15, DK-3460 Birkerød (DK).  (72) Inventor and (75) Inventor/Applicant (for US only): GRAM, Ole [DK/DK]; Pilegårdsparken 15, DK-3460 Birkerød (DK).</p>		<p>(81) Designated States: AT (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.  Published: With International search report In English translation (filed in Danish)</p>

(54) Title: PLASTIC CONTAINER AND APPARATUS FOR THE PRODUCTION THEREOF

(57) Abstract

A bag of plastic film or other material the front and back walls of which are welded together in such a pattern that there is produced an elongate and closed pouring channel (2) continuous with the product-holding space (5) of the bag. In the sealed areas (3) defining the pouring channel are provided two perforated lines (4), disposed in such a manner that there may be established, by a simple tear, starting more particularly from a punched-out tab (8) located inwardly of the outline of the bag and proceeding outwards toward said outline, a simple, well-defined and predetermined opening (10) in the pouring channel (2) and a detachment of same from the body of the bag. The initially opened and detached pouring channel (2) may subsequently be reclosed by inserting its extreme end (11) into a slit (12) in the sealed portion of the bag, the teeth (13) deriving from the tearing of the perforations (4) serving as a means for assisting the retention of the end of the pouring channel in the slit. The invention further relates to an apparatus for rational production of the aforementioned bag, said apparatus incorporating means for performing in one single operation the required welds as well as the cuts providing the perforations.



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Plastic container and apparatus for the production thereof.

The present invention relates to a bag, tube or other form of container, more particularly for holding liquids, made wholly or partially of a weldable and flexible material, for example  
5 a thermoplastic composition. The container has a pouring channel, preferably with converging sides and forming an integral part of the container, in which channel may be produced, by the method according to the invention, a simple and well-defined opening together with means for facilitating initial  
10 opening and, more particularly, reclosing of the container.

In the past various designs have been suggested for the manufacture of plastic bags for holding liquid substances. Such bags may be produced from long webs of thin and flexible plastic tube-film, which can be filled in advance with the  
15 material to be stored in the completed bag. The web may then be sealed by means of a high-frequency welding operation providing transverse weld seams across the web to produce bags, which are subsequently severed from each other to form individual bags, a portion of which may be removable by cutting,  
20 cf UK patent no. 713,629.

Similarly, a design of plastic bag is known which includes a pouring channel with parallel sides, for example as in French patent no. 1,154,361 and US patent no. 2,789,728. Further, in French patent no. 1,069,467 are suggested a number of versions  
25 in which a pouring channel is supplemented with means for reclosing the bag, in the form of a slit in the bag into which the opened end of the pouring channel can be inserted.

The specific character of the plastic container according to the present invention is described in the characterising part  
30 of claim 1.

A design in which the walls forming the front and backside of the container are joined together by suitably large heat sealed areas defining the outline of the pouring channel pro-

vides easy means for establishing in the bag perforations, cuts, scores or other lines of weakness. These will in turn make it possible to produce, by just tearing off an appropriate portion of the bag, slits in the bag extending along care-  
5 fully arranged and pre-determined lines.

Through a suitable choice of the arrangement of the perforations or other lines of weakness provided in the bag is achieved primarily a means for an easy, accurate and controlled opening of the bag without the use of scissors or other instruments. This implies the added advantage of it being possible to arrange that the tearing starts from a location inwardly of the outline of the bag and will proceed outwardly toward said outline, which will result in a smoother and more easily controlled tear. The perforations etc. may further be  
15 designed to provide, preferably in the same operation during which is produced the opening in the pouring channel, a higher degree of detachment of the pouring channel from the body of the container. For better material economy and for reasons attributable to production techniques, transportation and storage it is desirable that before opening the pouring channel  
20 should be associated firmly and throughout its length with the body of the bag, advantageously by letting it constitute an integral part of the bag, extending inwardly of the normally rectangular outline thereof. After opening, however, a  
25 suitable length of the discharge channel should be disengaged from the body of the plastic container, as this facilitates emptying the contents of the container, permitting the channel to serve as a kind of jet pipe or sucking straw. But more particularly because such an arrangement provides an improved  
30 means for reclosing the partially empty container. This applies whether it is desired to reclose the discharge channel, at this stage opened at the end, disengaged from the body of the bag and having a preferably elongate shape, by simply tying it into a knot or by tucking the end of the channel into  
35 a slit, pocket or other means for reclosing provided in the bag. For this purpose the teeth of the torn perforations, and

also any means glued or welded on to the bag, transverse scores or other lines of weakness provided especially in the sealed areas defining the interior of the pouring channel may serve to assist an effective tightening and securing of said channel.

5 Thus containers according to the present invention can be used for storing substances of widely different viscosity, ranging from highly viscous liquids such as mustard, mayonnaise, shampoo, lubrication grease, etc. to more fluid materials, such as milk, soft drinks, and beer, and possibly also fairly fine pow-  
10 ders. The accurate exit opening and the effective reclosing will reduce the risk of deterioration of the contents through leakage, evaporation, dehydration, oxidation and the like. This implies advantages of economy, owing partly to reduced wastage, and partly to the fact that such containers may replace more  
15 expensive packaging, such as metal tubes, glass containers, and plastic-coated cardboard containers.

Another advantage offered by containers produced according to the invention is related to the fact that this type of container may be produced, essentially, by means of known designs-  
20 of machinery for the manufacture of sealed bags. However, such machinery will have to be modified by means of auxiliary equipment in the form of welding jaws specially designed for welding together appropriate areas of the plastic bag and for providing the required perforations etc., preferably in one and the same  
25 operation.

In the following the invention will be more specifically described with reference to the annexed drawing in which

fig. 1 is a simple form of a sealed plastic bag according to the invention

30 fig. 2 a sealed plastic bag with integrated means for reclosing the bag

fig. 3 the same version in the opened state

fig. 4 the same version in the reclosed state



Referring to the drawing the plastic bag is indicated at 1 and the pouring channel at 2. The hatched areas 3 represent the areas by which the front and backwalls of the container are welded or in any other way joined together. The circled lines 5 represent the perforations 4, while the interior product-holding space 5 of the bag enclosed by the front and backwalls of the bag is directly continuous with the interior 6 of the pouring channel. Fig. 1 shows a simple embodiment of the invention, in which the right-side upper corner of the container 10 can be torn off along the perforated line 4 to allow the stored contents to pass out from the product-holding space 5 through the tubular space 6 in the now opened pouring channel 2.

For improved ease of emptying and especially of reclosing initially opened pouring channel 2 said channel should to some extent be detached from the rest of plastic bag 1. This object may suitably be achieved in the same operation as that in which pouring channel 2 is opened, so that one tear will suffice for both purposes. The tearing may in this case, as shown in fig. 2, advantageously start inwardly of the outline of the bag, for example, from a cut 7 provided in the sealed area 3a. Said cut 7 may, for example, have the form of an especially easily torn perforation, defining a tab 8 which is easily gripped firmly with the fingers and which may include means for assisting a firm grip, for example in the form of impressions, pieces of material attached by welding, or any other means for that purpose. Where tab 8 is only required to be detached and bent back, cut 7 will define a hole which may serve, for example, as a means for carrying or suspending bag 1 in the unopened state during transportation, for display purposes, or the like. In addition to perforation 4 the bag may be provided with another perforation 4a, disposed, for example, in a straight line extending preferably in the sealed portion 3a and, like perforation 4, issuing from cut 7. This perforation 35 or other type of weak line can suitably be arranged to be torn off in the same operation as perforation 4. Thus is achieved, as it will appear from fig. 3, in a single tear, not only

opening and detachment of the pouring channel, but also removal of a portion 9 of the material constituting the bag, which makes pouring channel 2 more accessible.

From figs. 2 and 3 appears that the exit opening 10 of pouring channel 2 need not be located in the extreme end 11 of the pouring channel, but can advantageously be placed in the side of pouring channel 2. In this way is achieved an especially effective emptying of the pouring channel, more particularly in cases where the stored contents are viscous or sticky liquids, the channel being emptied, for example, by gripping between two fingers the portion of the container in which the interior product-holding space 5 narrows and becomes the pouring channel 2 and then passing the fingers toward the end 11 of the pouring channel. In this way the contents present in the interior 6 of the pouring channel will be squeezed out through the opening 10 without soiling the fingers gripping the channel, which would more likely occur if opening 10 had been placed at the extreme end 11 of the pouring channel. This is also advantageous with a view to reclosing the container, as opening 10 does not in this case distend the extreme end 11 of the pouring channel. As shown in fig. 4, the container may be reclosed by bending back as large a portion as possible of pouring channel 2 and tucking it, extreme end 11 first, into a slit 12 provided in the sealed portion 3b of the bag.

In this form of reclosing the teeth 13 produced by tearing perforations 4 along the sides of pouring channel 2 may be useful by serving to retain the discharge channel in slit 12 in a tightened position. The retaining effect may be enhanced, if desired, by providing pouring channel 2 with impressions, grooves, protuberances, pieces of material attached to the channel by means of welding or gluing, or other means for achieving a more effective reclosing. Slit 12 may be replaced, if desired, by two or more slits or slots, by specially designed pockets or the like, suitable for receiving and holding pouring channel 2. Regardless of the method chosen for reclosing the pouring channel may easily be opened again with



~~the fingers, owing to the suitably elastic nature of the con-~~  
tainer. The preferably sealed area 3b around slit 12 may ad-  
vantageously be provided with grooves, impressions, pieces of  
material attached by welding, or other means for achieving a  
5 firm grip. By taking the sealed portion 3b of the bag between  
two fingers, at the same time gripping tab 8 with the other  
hand and opening pouring channel 2 is prevented that the con-  
tents stored in the flexible container are forced out prema-  
turely. Where the contents of the bag consist more particu-  
10 larly of highly viscous or sticky materials, slit 12 or other  
means for reclosing may, if desired, be omitted, since ade-  
quate reclosing can be achieved by just pressing the walls de-  
fining the interior of the pouring channel closely together.

As illustrated especially in fig. 2, a number of containers  
15 may be interconnected by means of perforations arranged betwee  
the individual containers. After severing the teeth 13 deri-  
ving from the torn perforations constitute a further means for  
retaining pouring channel 2 in slit 12. Thus joined by their  
tops, two containers, both of which designed with the pouring  
20 channel located in its uppermost portion, may be placed and  
maintain stability in an upright position, which will extend  
their field of application, especially if they share the same  
pouring channel. Finally, it can be achieved, by means of per-  
forations 4b or other forms of lines of weakness provided in  
25 the material, that severing the interconnected bags need not  
take place in direct continuation of their production. This  
makes it possible for them to be transported, stored, marketed  
etc., in composite units, the individual bags being joined  
lengthwise or sidewise to continuous strips, or perhaps peri-  
30 pherally, to form a sheet, after the fashion of stamps. This  
means that relatively small, easily separated portions of the  
material in question may be marketed together. This arrange-  
ment is further advantageous in that it facilitates measuring  
out of small, definite quantities, for example, of food or  
35 medicine with a high degree of accuracy.



The design of an apparatus for the production of containers according to the present invention may advantageously be based on the principles known, for example, from machinery for sealing bags or said apparatus may even be realised as a modification of existing machines. However, special welding jaws will have to be designed which include a pattern corresponding to all areas 3, indicated in fig. 2 by hatching, by which the two walls of the container are to be welded or by other means joined together. All welds to be effected in connection with the production of one single bag, or, where appropriate, of two or more bags joined together can advantageously be made in one operation. The apparatus should further include a means for the preferably simultaneous production of all perforations 4, cuts 7 and 12 or other forms of lines of weakness, indicated in fig. 2. This means may, for example, be in the form of movable needles, cutting edges, or the like, built into the welding jaws. In an especially advantageous design of said means these are provided in the welding jaws in the form of sections of extra high energy, or the like, which, for example, by melting away some of the material of the container, can produce in the material well-defined holes or other forms of lines of weakness, suitably in the same operation which joins together the front and back walls of the container. Cuts such as 7 and slit 12 may thus, if desired, be established in the material in the form of series of closely spaced holes constituting easily tearable perforations. By means of apparatus according to the invention may further be achieved that the severing of the individual bags from each other, usually performed in direct continuation of the production of the bags, may be omitted, since said severing may easily be done, for example, by the ultimate consumer. Consequently, the apparatus may also appropriately be provided with means, for example, for reeling the interconnected containers on large drums, or for utilising in any other way the perforations provided in the containers.



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Claims:

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1. Bag, tube or other form of container, more particularly for holding liquids, made wholly or partially of a preferably weldable and flexible material, for example a thermoplastic composition, and having a pouring channel (2) preferably with converging sides, in which are provided, preferably in the sealed areas (3) around the interior (6) of the pouring channel by which the front and back walls of the container are welded or by some other means joined together, perforations (4), cuts (7) scores, other forms of lines of weakness or combinations thereof, arranged in such a way that when torn by hand they cause the production of a well-defined and predetermined opening (10) in the pouring channel (2).

2. Bag, tube or other form of container as claimed in claim 1, in which said perforations (4), cuts (7) or other forms of lines of weakness for opening the container are arranged in such a way that the tear starts from a point inwardly of the outline of the container and proceeds outwards toward said outline, the starting point being preferably in the form of a tab (8), a cut (7) or other means located farther from the outline of the container than the extreme end of the interior (6) of the pouring channel or the product-holding space (5) of the container.

3. Bag, tube or other form of container as claimed in claim 1, in which said perforations (4) or other forms of lines of weakness are arranged in such a way that the tear producing the opening (10) in the pouring channel (2) may suitably have the additional effect of causing the pouring channel (2) to become more detached from the body of the container (1) than before the tear.

4. Bag, tube or other form of container as claimed in claim 1, in which the opening (10) in the pouring channel (2) is produced mainly in the side of the channel and not, or not exclusively, in the extreme end (11) thereof.



5. Bag, tube or other form of container as claimed in claim 1,  
in which the opened pouring channel (2) has teeth (13) deriving  
from the torn perforations, impressions, pieces of material at-  
tached by welding or gluing, or other means that may provide an  
5 effective reclosing, for example by assisting the retention of  
the pouring channel (2) in a slit (12), pocket, or the like,  
including, for example, a piece of paper affixed by gluing to  
protect the area in which the opening (10) is to be established  
from contamination.
- 10 6. Apparatus for realising the method according to claim 1 in  
which are provided welding jaws or other means of a design  
suitable for joining together the sides of the film which will  
form the front and back walls of the filled container by appro-  
priate areas (3), preferably in one single operation.
- 15 7. Apparatus as claimed in claim 6, in which there are further  
provided means capable of producing perforations (4), cuts (7)  
and (12), or other forms of lines of weakness in the container  
material, preferably in the same operation in which the front  
and back walls of the container are joined or in direct con-  
20 nection therewith.
8. Apparatus as claimed in claim 6, in which there are provided  
in the welding jaws needles, cutting edges or other means capa-  
ble of producing well-defined holes or other lines of weakness  
in the container.
- 25 9. Apparatus as claimed in claim 6, in which there are provid-  
ed, for example in the welding jaws, high energy points or a-  
reas capable of producing perforations (4), cuts (7) and (12)  
or other forms of lines of weakness, preferably by melting a-  
way portions of the container material.

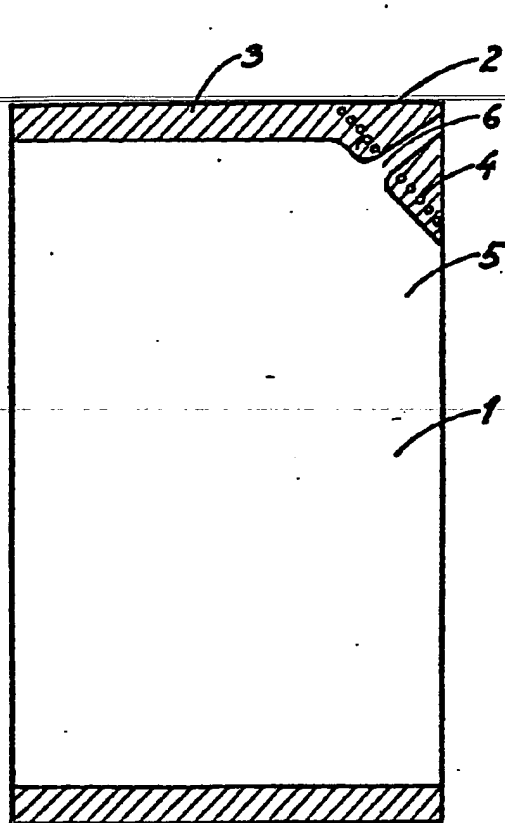


Fig. 1

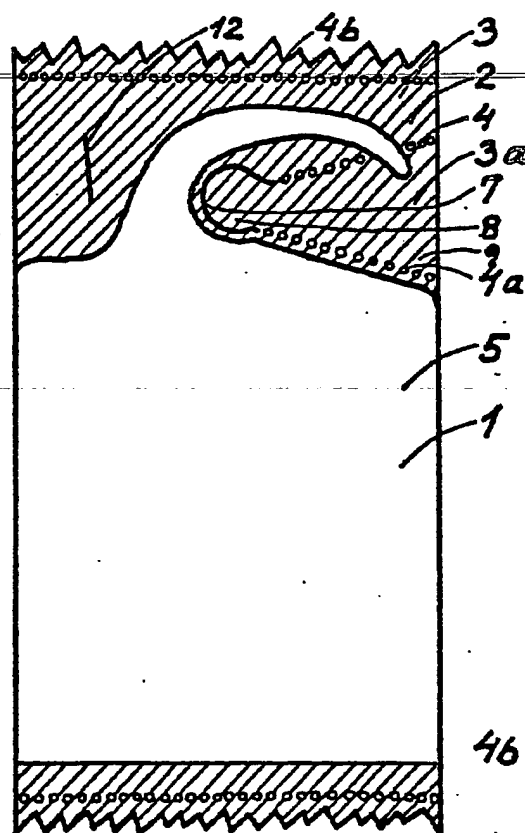


Fig. 2

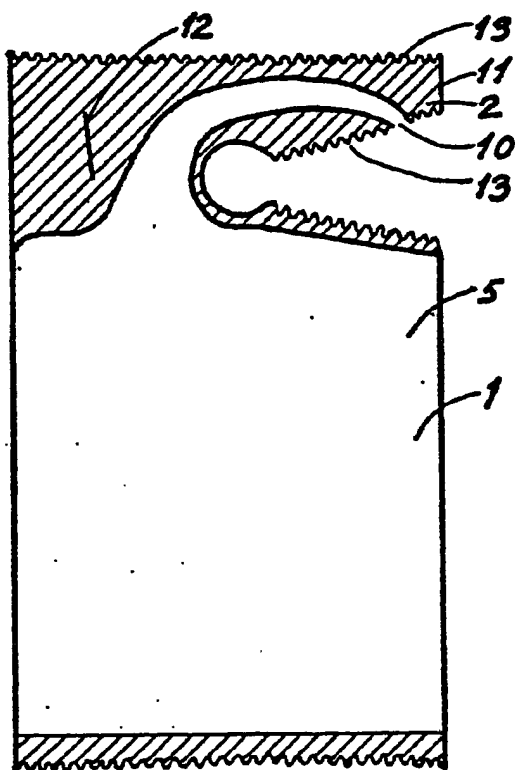


Fig. 3

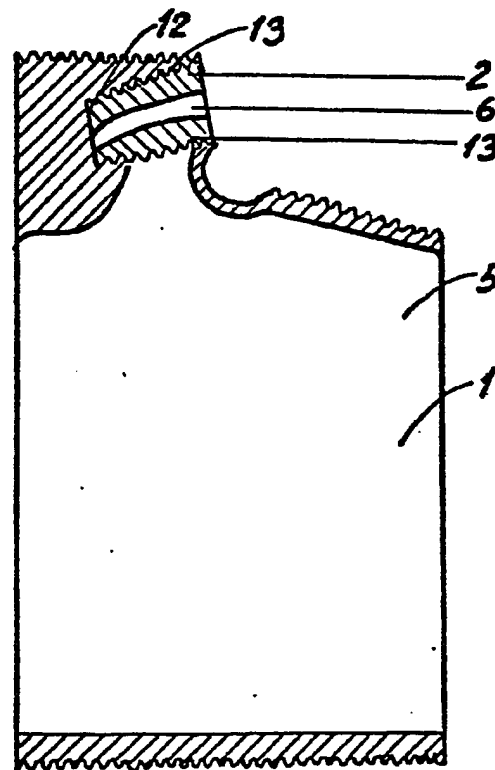


Fig. 4

# INTERNATIONAL SEARCH REPORT

International Application No PCT/DK79/00022

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) * According to International Patent Classification (IPC) or to both National Classification and IPC B 65 D 75/62, B 29 C 27/02						
<b>II. FIELDS SEARCHED</b> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Minimum Documentation Searched *</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%; border-bottom: 1px solid black;">Classification System</th> <th style="border-bottom: 1px solid black;">Classification Symbols</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">IPC</td> <td style="padding: 5px;">B 65 D 33/16, 33/24, 33/36-38, 75/58-62, 77/30, 77/38, 77/40; B 29 C 27/02; B 65 B 61/02 .../...</td> </tr> </table> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched *</div>			Classification System	Classification Symbols	IPC	B 65 D 33/16, 33/24, 33/36-38, 75/58-62, 77/30, 77/38, 77/40; B 29 C 27/02; B 65 B 61/02 .../...
Classification System	Classification Symbols					
IPC	B 65 D 33/16, 33/24, 33/36-38, 75/58-62, 77/30, 77/38, 77/40; B 29 C 27/02; B 65 B 61/02 .../...					
SE, NO, DK, FI classes as above						
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> 14						
Category *	Citation of Document, 16 with indication, where appropriate, of the relevant passages 17	Relevant to Claim No. 18				
X	NO, C, 98 372 published 1961, July 24, Packaging Frontiers Inc.	1,3-5				
A	FR, A5, 1 069 467 published 1954, July 8, M.L. Clot	5				
X	FR, A1, 2 262 627 published 1975, September 26, Etablissement J.J. Carnaud & Forge De Basse-Indre	1,3				
X	US, A, 3 083 876 published 1963, April 2, W.S. Schneider Et Al	1,3				
X	US, A, 3 224 640 published 1965, December 21, W.S. Schneider Et Al	1,3,5				
X	US, A, 3 384 528 published 1968, May 21, M. Lehmacher Et Al	6-9				
X	US, A, 4 083 747 published 1978, April 11, Windmöller & Holscher	6-9				
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents: 15</p> <p>"A" document defining the general state of the art</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document cited for special reason other than those referred to in the other categories</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> </div> <div style="width: 45%;"> <p>"P" document published prior to the international filing date but on or after the priority date claimed</p> <p>"T" later document published on or after the international filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance</p> </div> </div>						
<b>IV. CERTIFICATION</b>						
Date of the Actual Completion of the International Search *  1979-09-27		Date of Mailing of this International Search Report *  1979-10-01				
International Searching Authority *  Swedish Patent Office		Signature of Authorized Officer 20 Leif Hagström				

## FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II

Continuation Fields Searched :

Deutsche Klassen: 81c 22  
81c 27

US Classification: 222/107  
229/62  
156/510, 515, 251

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE <sup>10</sup>

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers \_\_\_\_\_, because they relate to subject matter <sup>12</sup> not required to be searched by this Authority, namely:

2. ☐ Claim numbers \_\_\_\_\_, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out <sup>12</sup>, specifically:

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING <sup>11</sup>

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

## Remark on Protest

- ☐ The additional search fees were accompanied by applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

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